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(57) [Abstract]

[Purpose] To obtain an external preparation for skin which has an effect on preventing or curing rough skin or the like.

[Constitution] The external preparation for skin is an external preparation for skin blended with a water extract liquid of soybeans, and is blended with a soaked liquid of whole soybeans, dehulled soybeans or defatted soybeans, an ultrafiltrate of soymilk or a concentrated liquid of whey.

[Claims]

[Claim 1] An external preparation for skin comprising a water extract liquid of soybeans. [Claim 2] The external preparation for skin according to claim 1, wherein the water extract liquid is a water soaked liquid of whole soybeans, dehulled soybeans or defatted soybeans. [Claim 3] The external preparation for skin according to claim 1, wherein the water extract liquid is a filtrate obtained by filtering soymilk made from whole soybeans, dehulled soybeans or defatted soybeans with an ultrafiltration membrane. [Claim 4] The external preparation for skin according to claim 1, wherein the water extract liquid is whey generated during the production of a soy protein isolate. [Claim 5] A process for producing an external preparation for skin characterized by

soaking whole soybeans, dehulled soybeans or defatted soybeans in water at 5 to 100°C for 5 minutes to 20 hours, removing soybeans, to the obtained soaked liquid as such or after it is concentrated, adding any of a variety of bases, fragrances, colorants and the like and mixing them. [Claim 6] A process for producing an external preparation for skin characterized by grinding whole soybeans, dehulled soybeans or defatted soybeans while adding water thereto, filtering the ground matter after it is heated, filtering the obtained soymilk with an ultrafiltration membrane, and to the resulting filtrate as such or after it is concentrated, adding any of a variety of bases, fragrances, colorants and the like and mixing them. [Claim 7] A process for producing an external preparation for skin characterized by adding any of a variety of bases, fragrances, colorants and the like to whey generated during the production of a soy protein isolate by a standard method as such or after the whey is concentrated and mixing them.

[Detailed Description of the Invention]

[0001]

[Industrial Field of Application]

The present invention relates to an external preparation for skin blended with a water extract liquid of soybeans, and a process for producing the same.

[0002]

[Prior Art] An external preparation for skin such as a hand cream is intended to impart a moisturizing effect and prevent or cure rough skin, and products blended with any of various medicinal components are available on the market. On the other hand, it has been confirmed that a glycoside in a soybean has various physiological actions. Further, various external preparations for skin in which a soybean component is used such as a whitening cosmetic containing a soybean isoflavone compound (JP-B-60-19885), a cosmetic composition containing soybean saponin (JP-A-59-106419) and a moisturizing agent containing a water extract of soybean embryonic axes as an active ingredient (JP-A-63-243013) have been proposed.

[0003]

[Problems that the Invention is to Solve] Any of these has been achieved by focusing attention on a specific component in a soybean, and requires a complicated process for isolating such a component. The present inventors focused attention on a soaked liquid of soybeans, which is generated as a by-product during the production of tofu, and conducted studies for aiming at making efficient use of the soaked liquid. As a result, they surprisingly found that the soaked liquid itself has an effect as an external preparation for skin. Further, they found that a filtrate generated as a by-product during the ultrafiltration concentration of soymilk and whey generated during the production of a soy protein isolate also have a

similar effect. The present invention has been completed based on these findings. Hereinafter, the present invention will be described specifically.

[0004]

[Means for Solving the Problems] A water extract liquid of soybeans to be used in the present invention is a soaked liquid obtained by soaking whole soybeans, dehulled soybeans or defatted soybeans in water, "whey" generated as a by-product during the production of a soy protein isolate, a filtrate obtained by filtering soymilk with an ultrafiltration membrane or the like. As for the components of these, for example, one example of the components of a filtrate obtained by filtering soymilk with an ultrafiltration membrane is shown below.

[0005]

Proteins: 0.06%, Saccharides: 2.05%, Amino acids: 0.04%, Isoflavones: 0.08%, Fats: 0.05% or less, Others such as vitamins (including B1, B2, B6, H, niacin, pantothenic acid, inositol and the like)

[0006] Such a water extract liquid is prepared in such a manner that a soluble sugar content determined in accordance with the determination method shown below is in the range of 1 to 10%, and any of a variety of bases, fragrances and colorants are added thereto, whereby an external preparation for skin product is prepared. Incidentally, the soluble sugar content as used herein means the content of water-soluble sugars that are

eluted by soaking in water, grinding and the like, and can be obtained by the following method.

[0007] Determination method of soluble sugar content: A sample (a soaked liquid, a filtrate obtained by filtering soymilk with an ultrafiltration membrane, soybean whey or the like) is adjusted to pH 4.5 with hydrochloric acid thereby to allow proteins to precipitate, centrifugation is carried out, and a sugar concentration in the resulting supernatant is obtained as a glucose level by the phenol-sulfuric acid method. When the present invention is described in the case where a soaked liquid of dehulled soybeans is used as a raw material, it is as follows. When whole soybeans are heated with hot air at 80 to 300°C and pressed with a roller, they are separated into cotyledons, embryonic axes and hulls, therefore, the cotyledon portions are collected and used as dehulled soybeans. The resulting dehulled soybeans are soaked in water in an amount 3 to 10 times the weight of soybeans for 5 minutes to 20 hours.

[0008] The soaking temperature is in the range of 5 to 100°C, and as the soaking temperature is higher, the soaking time can be shortened. That is, it is only necessary to soak soybeans under the conditions in which water-soluble components in soybeans can be sufficiently extracted. However, in the case where soaked soybeans are used as a raw material for tofu or the like, it is necessary to consider the elution of proteins. Therefore, as preferred conditions, soaking is carried out at

20 to 30°C for 8 to 20 hours, at 40 to 55°C for 1 to 6 hours or 70 to 90°C for 5 to 30 minutes. After the soaking, separation into soybeans and soaked liquid is carried out, and this soaked liquid is used as a raw material. In the case where whole soybeans are used as a raw material, the same procedure for dehulled soybeans is applied except that the soaking time is made longer. In the case where this soaked liquid is concentrated, concentration under reduced pressure is carried out under the conditions of 45 to 65°C and 600 to 700 mmHg in such a manner that the soluble sugar content is in the range of 10 to 50 g/100 ml.

[0009] The resulting concentrated liquid is mixed with, for example, a hydrophilic ointment base at a ratio of 2 : 8 to 5 : 5, and as needed, a fragrance or the like is added and mixed, whereby an external preparation for skin is prepared. Incidentally, the soluble sugar content in the preparation is set to 1 to 10%, which is a guide. In the case where a soaked liquid of defatted soybeans is used as a raw material, defatted soybeans are soaked at 20 to 30°C for 2 to 3 hours, or at 40 to 55°C for 0.5 to 1 hour. In this case, in order to prevent the elution of proteins as much as possible, the pH of water for soaking during soaking is preferably adjusted at 4 to 5 with an organic acid or an inorganic acid. Thereafter, the same procedure as the case of dehulled soybeans is carried out and an extract liquid is obtained.

[0010] In the case where a permeated liquid (filtrate) obtained by ultrafiltration concentration of soymilk is used as a raw material, soymilk obtained by the same method as the case where tofu or a soymilk beverage is produced using whole soybeans or dehulled soybeans as a raw material is concentrated with an ultrafiltration membrane having a fractionation molecular weight of 100,000 to 300,000, the resulting filtrate is collected, the soluble sugar content thereof is adjusted, and the filtrate is mixed with a hydrophilic ointment base, whereby an external preparation for skin is prepared.

[0011] In the case where whey generated as a by-product during the production of a soy protein isolate is used as a raw material, for example, 10 times volume of water is added to defatted soybeans, the pH thereof is adjusted to 7.5 with sodium hydroxide, and the mixture is stirred at room temperature for 2 hours. Then, insoluble matter (bean curd refuse) is removed by solid-liquid separation, whereby a protein-containing liquid is obtained. The pH of this liquid is adjusted to 4.5 with hydrochloric acid to allow the proteins to precipitate, and solid-liquid separation into a protein fraction (soy protein isolate) and whey is carried out. Then, the soluble sugar content in the whey is adjusted and the whey is mixed with a hydrophilic ointment base, whereby an external preparation for skin is prepared. The thus obtained external preparation for skin has an effect on preventing rough skin,

curing hand eczema, and moreover preventing skin inflammation or itching caused by athlete's foot and the like. Hereinafter Examples will be described.

[0012]

[Examples]

Example 1: Whole soybeans were heated with hot air at 75°C, and then pressed and dehulled with a roller. Then, hulls and embryonic axes were removed, whereby dehulled soybeans each of which was divided into two pieces were obtained. These dehulled soybeans were ground while adding 10 times volume of cold water (5°C) thereby to obtain mashed soybeans. The resulting mashed soybeans were heated at 100°C for 30 seconds, and then cooled to 80°C, and solid-liquid separation was carried out using a screw decanter, whereby soymilk was obtained. The obtained soymilk was degassed, and thermal sterilization at 120°C for 3 minutes was carried out. Then, the concentration of proteins was adjusted to 3.5%, and the soymilk was filtered with an ultrafiltration membrane having a fractionation molecular weight of 300,000, and a low molecular weight fraction was collected as a filtrate. The soluble sugar content in this filtrate was 2.05 g/100 ml in terms of the glucose level.

[0013] This filtrate was concentrated under reduced pressure in such a manner that the soluble sugar content was 20.5 g/100 ml, and an ointment base (a hydrophilic ointment: Kozakai

Pharmaceutical Co., Ltd.) was mixed with this concentrated liquid at a ratio of 8 to 2 (ointment base : concentrated liquid), whereby a skin application agent (ointment) was obtained.

[0014] Use example: Subjects who had the symptoms shown in Table 2 were allowed to use the above-mentioned ointment by applying it on the affected area three times daily and the conditions after the use were examined through interviews. The results are shown in Table 2.

[0015] Table 2: A subject in her 20's (female). Symptoms: The pads of the fingers of the right hand were red and swollen and the surface skin was thin but hard. The back side areas between fingers on the right hand turned red, and itching accompanied. After use: The itching disappeared after 2 days, the rough skin was improved after 6 days, and a complete cure was achieved after 4 weeks.

A subject in her 20's (female). Symptoms: The pads of the fingers of both hands were red and swollen and the skin was hard. In particular, the joints of the forefinger and the middle finger of the left hand could not be extended and kept bending. It hurt when it was put in water. Similar symptoms appeared in the back side of the hand. There was itching in the area turning red between the fingers of the left hand. After use: The fingers could bend after one day. The redness became less on the whole and the itching occurring after taking a bath was relieved. The ointment is continuously in use.

[0016] A subject in her 30's (female). Symptoms: The area between the thumb and the forefinger of the right hand had a problem like chapped skin and an area with small chaps hurt and there was itching on the whole (diagnosed as housewives' eczema).

After use: The pain and itching disappeared after 2 days. A complete cure was achieved after 1 month.

A subject in her 30's (female). Symptoms: There was itching on the whole body in normal conditions and the itching was particularly severe in the shoulder and back.

After use: One application thereof stopped the itching for 1 to 2 days.

[0017] A subject in her 30's (female). Symptoms: The finger tips of the right hand chapped in places.

After use: All chaps were cured after 3 days. After that, small chaps appeared in the finger tips in places, however, the finger tips did not chap after 1 month as long as the ointment was applied.

A subject in her 30's (female). Symptoms: Several chilblains were caused in the left hand fingers, which caused inflamed skin and resulted in severe tissue damage.

After use: Flesh rose up after 2 weeks and a complete cure was achieved.

[0018] A subject in her 30's (female). Symptoms: There were red spots on the ankle and they started to itch when being warmed

up.

After use: Itching disappeared after 3 days and a complete cure was achieved after 2 weeks.

A subject in her 40's (female). Symptoms: The area around the mouth were red and swollen and there was stabbing itching.

After use: The redness became less and less distinguished and the itching disappeared after 1 day. The symptoms disappeared thereafter, however, the ointment is continuously in use.

[0019] A subject in her 40's (female). Symptoms: The heels were rough. The hands were rough.

After use: The heels became smooth and the hands started to have a moisturized texture after 3 days.

A subject in his 40's (male). Symptoms: Atopic eczema appeared on the legs and there was itching.

After use: The itching disappeared right after the application thereof. The affected area dried out and the brown color of the skin of the affected area became lighter.

[0020] Example 2: Whole soybeans were heated with hot air at 75°C, and then pressed and dehulled with a roller. Then, hulls and embryonic axes were removed, whereby dehulled soybeans each of which was divided into two pieces were obtained. These dehulled soybeans were soaked in hot water at 55°C adjusted to pH 9 with an alkali for 2 hours, and a soaked liquid was separated. The soluble sugar content in this soaked liquid was 0.99 g/100 ml in terms of the glucose level. This soaked

liquid was centrifuged (3,000 rpm), and the resulting supernatant was concentrated under reduced pressure at 650 mmHg and 60°C until the soluble sugar content was 20.0 g/100 ml. The resulting concentrated liquid was treated in the same manner as in Example 1, whereby an ointment was obtained.

[0021] Example 3: Defatted soybean flakes were soaked in 10 times volume of water adjusted to pH 5.0 with lactic acid at 25°C for 2 hours. After the soaking, filtration was carried out, and the resulting filtrate was subjected to thermal sterilization at 140°C for 2 minutes. The soluble sugar content in this filtrate was 0.95 g/100 ml in terms of the glucose level. The filtrate was concentrated under reduced pressure until the soluble sugar content was 20.5 g/100 ml. The resulting concentrated liquid was treated in the same manner as in Example 1, whereby an ointment was obtained.

[0022] Example 4: Whole soybeans were heated to 75°C with hot air, and then dehulled and rolled. Then, the resulting soybeans were defatted with hexane, and to the defatted soybeans, 4 times volume of water adjusted to pH 7.5 with sodium hydroxide was added. The mixture was stirred at room temperature for 2 hours, and solid-liquid separation was carried out, and then insoluble matter was removed. The resulting protein-containing solution was adjusted to pH 4.5 with hydrochloric acid thereby to allow proteins to precipitate, and solid-liquid separation was carried out again.

Incidentally, the soluble sugar content in the resulting whey was 1.53 g/100 ml in terms of the glucose level.

[0023] Glycerol and ethanol were mixed in the whey at a ratio of 15 : 10 : 100 (glycerol : ethanol : whey), and an external preparation for skin in a liquid form was obtained.